

CLAIMS

1. An optical control type phased array antenna, comprising:
laser generating means for generating a light having a single wavelength;

optical path branching means for branching the emitted light from the laser generating means into first and second transmission lights;

high frequency signal generating means for generating a high frequency signal;

optical frequency modulating means for shifting a frequency of the first transmission light obtained through the branching by the optical path branching means by a frequency of the generated high frequency signal;

spatial light phase modulating means for carrying out spatial phase modulation corresponding to an antenna beam pattern for the first transmission light having the frequency shifted by the frequency of the generated high frequency signal;

optical path branching/multiplexing means for multiplexing the first transmission light subjected to the phase modulation and the second transmission light obtained through the branching by the optical path branching means;

aperture dividing/light collecting means for dividing one transmission light obtained through the branching of the transmission light obtained through the multiplexing by the optical

path branching/multiplexing means into a plurality of transmission lights;

a plurality of optoelectronic converting means for converting light intensities of the plurality of pairs of transmission lights into electrical signals, respectively; and

a plurality of element antennas for radiating the electrical signals from the plurality of optoelectronic converting means as beams, respectively,

wherein optical path lengths of two paths between the optical path branching means and the optical path branching/multiplexing means are equalized.

2. An optical control type phased array antenna according to claim 1, further comprising:

second optoelectronic converting means for converting a light intensity of a transmission light obtained through branching of the transmission light obtained through the multiplexing by the optical path branching/multiplexing means into an electrical signal;

phase error detecting means for detecting a phase difference between the electrical signal generated by the high frequency signal generating means and the electrical signal from the second optoelectronic converting means; and

optical phase modulating means for modulating a phase of one of the first and second transmission light obtained through the

branching by the optical path branching means based on the phase difference detected by the phase error detecting means.

3. An optical control type phased array antenna according to claim 2, further comprising voltage converting means for converting a first voltage signal corresponding to the phase difference detected by the phase error detecting means into a second voltage signal,

wherein the optical phase modulating means modulates the phase of one of the first and second transmission light obtained through the branching by the optical path branching means in correspondence to the second voltage signal.

4. An optical control type phased array antenna, comprising:

laser generating means for generating a light having a single wavelength;

optical path branching means for branching the emitted light from the laser generating means into first and second transmission lights;

high frequency signal generating means for generating a high frequency signal;

optical frequency modulating means for shifting a frequency of the first transmission light obtained through the branching by the optical path branching means by a frequency of the generated high frequency signal;

spatial light phase modulating means for carrying out spatial phase modulation corresponding to an antenna beam pattern for the first transmission light having the frequency shifted by the frequency of the generated high frequency signal;

optical path branching/multiplexing means for multiplexing the first transmission light subjected to the phase modulation and the second transmission light obtained through the branching by the optical path branching means;

aperture dividing/light collecting means for dividing one transmission light obtained through the branching of the transmission light obtained through the multiplexing by the optical path branching/multiplexing means into a plurality of transmission lights;

a plurality of second optical path branching means for two-branching the plurality of transmission lights obtained through the division by the aperture dividing/light collecting means, respectively;

a plurality of balanced receiver means for converting light intensities of the plurality of pairs of branching transmission lights into electrical signals, respectively, for every pair of transmission lights obtained through the two-branching;

a plurality of element antennas for radiating the electrical signals from the plurality of balanced receiver means as beams, respectively;

optoelectronic converting means for converting a light intensity of the other transmission light obtained through the branching of the transmission light obtained through the multiplexing by the optical path branching/multiplexing means into an electrical signal;

phase error detecting means for detecting a phase difference between the electrical signal generated from the high frequency signal generating means and the electrical signal from the optoelectronic converting means; and

light phase modulating means for modulating a phase of one of the first and second transmission light obtained through the branching by the optical path branching means based on the phase difference detected by the phase error detecting means,

wherein optical path lengths of two paths between the optical path branching means and the optical path branching/multiplexing means are equalized.